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A LEAD PENCIL

by
GWEN CROSS

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CHAPTER I

WRITING LONG AGO

WE write letters and words on paper with pencils or pens and ink. Most people begin at the left and cross the page to the right. Long ago men did not write like this. The Egyptians and Chinese were the first people to write. They did not write words but they made little pictures. Each picture was the sign for a word. In Egypt the picture of an eye meant the noun "eye" or the verb "to see."

The Egyptians did this picture writing on rocks by cutting the rocks with hard stones. People can see these pictures in Egypt now. They were made very long ago before the days of Moses. Later the same little pictures meant the sound in place of the word. Then the Egyptians wrote on skins and leaves with sharp reeds and inks. They wrote from left to



WRITING CUT ON A STONE
OVER 2,100 YEARS AGO

A LEAD PENCIL

right, from right to left, or one word under another, as they liked.



CHINESE PICTURE WRITING

The Chinese made their picture signs with brushes and ink. They made them one under the other. Each sign was different. To read and write, Chinese children learnt thousands of signs. Now the government has made the language easier, and there are fewer signs. Today many Chinese write with our kind of letters.

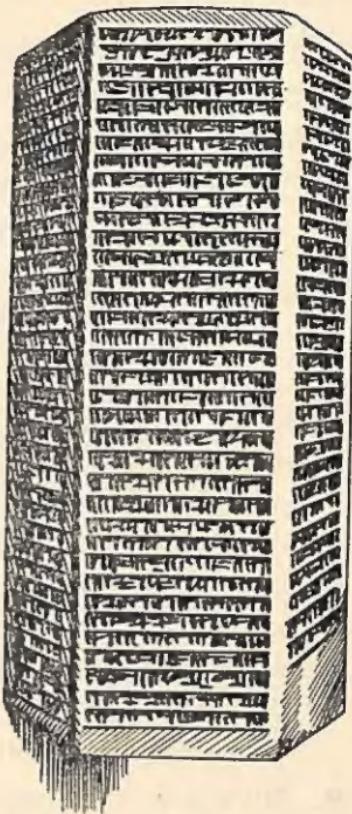
The Hebrews also cut writing on rocks and stones. Later they made writing tables with white wood. They wrote on these from right to left with reeds and black dye. The people of Babylon in Mesopotamia wrote on clay bricks. They cut the writing with sharp pieces of bone or wood and then baked the bricks so that they became hard. Men still find these clay bricks with writing

WRITING LONG AGO

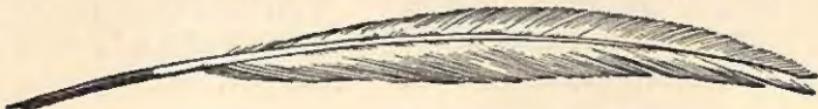
on them in the sands of Mesopotamia. The Greeks sometimes wrote on wax with sharp pieces of wood. They got the wax from bees. Wax is soft and yellow.

In the sixth century after Christ was born, people in Europe began to write with quills. A quill is the hollow stem of a feather. They often used goose feathers.

In the nineteenth century men first made steel pens. They also used blacklead from the ground. They put it into silver cases to make pencils. Now men make pencils with wood and blacklead.



WRITING ON A CLAY
BRICK



A QUILL PEN

A LEAD PENCIL

THINGS TO DO

1. Try to get a feather. Draw it. Cut the end to make a quill pen.
2. Melt some fat (candle grease, mutton fat, etc.) in the lid of a tin. When it is cold and hard write on it your initials and the date. Do you think anything written on wax would stay for many years?

QUESTIONS

1. When did men begin to write with quill pens?
2. What people wrote on wax?
3. If you wrote your name on a new, soft clay brick and wanted it to stay, what would you do?
4. What children made picture signs with brushes?

A. A century is 100 years. The first century was from A.D. 1 to A.D. 100. The second century was from A.D. 101 to A.D. 200.
Between what years was (a) the sixth century, and (b) the nineteenth century? What century is this?

B. Put together the beginnings of sentences in A with the correct ends in B.

A.

The Hebrews wrote on
The Chinese wrote with
The Egyptians wrote with
The Greeks wrote on
The Babylonians wrote on

B.

clay bricks
wax.
writing tables.
brushes and ink.
sharp reeds.

C. Draw pictures that you think would be right for signs of these words:

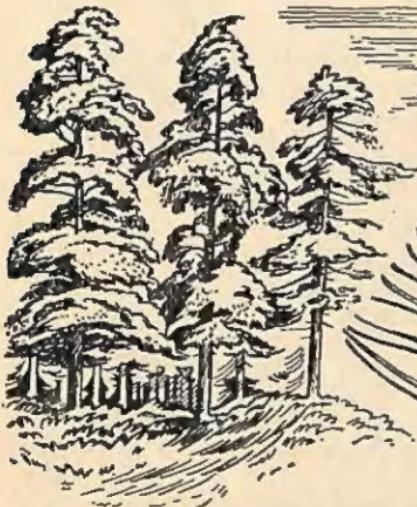
a man, a house, to sail, to pray, to smell

CHAPTER II

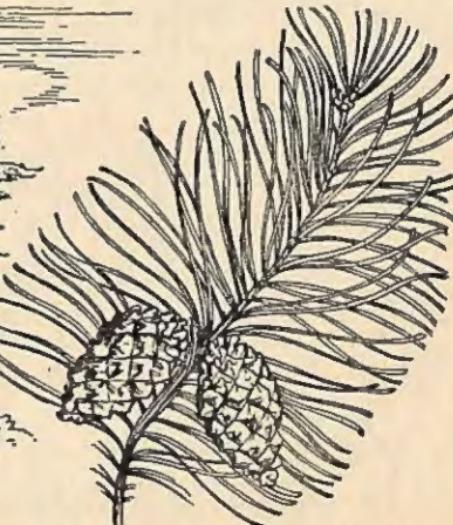
WOOD FOR PENCILS

SOMETIMES when we sharpen a pencil the wood is rough and difficult to cut. These pencils are cheap because the wood is not good. Many cheap pencils are made in Japan. The wood of the juniper tree makes very good pencils because it is soft and smooth to cut. Pine wood is also used for pencils. It also is soft but it does not cut well like juniper wood.

Juniper and pine trees are evergreen plants. Their leaves stay green and do not fall to the ground in winter. They grow in cold countries



PINE TREES



LEAVES AND FRUITS

A LEAD PENCIL

where the summers are short and the winters long. Evergreen plants in cold countries need their leaves to make food in the winter sunshine, because they cannot make enough food in the short summer. Evergreen trees have soft wood.

The leaves of these evergreens are thin and like needles. A lot of snow cannot stay on them. If they had big leaves, much snow would stay on them. It would be heavy and the branches would break.

There are many evergreen trees, juniper, pines, and others in U.S.A., Russia, Canada, Norway, and Sweden, and on the high parts of mountains in other countries. In all these countries there

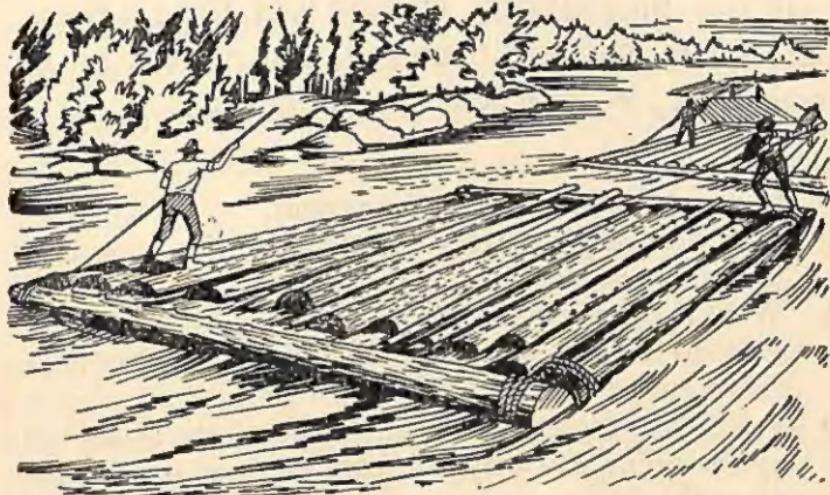


LOGGERS AT WORK

WOOD FOR PENCILS

are men called "loggers". They cut down trees, take away the branches, and send the logs to saw-mills.

The men fix chains to the big logs and horses pull them to a river. The men tie some big logs together to make a square, and then they put the other logs inside the square side by side. The logs are then made to float down the river. The loggers have sharp nails on their boots, so they can walk on the logs without slipping. They also have long sticks to guide the logs.



LOGS FLOATING DOWN A RIVER

When the logs arrive at a wood cutting mill a big sharp, round saw cuts them into many long, smooth planks. These wait to become dry in the air. Wood that is not dry is called green wood. It shrinks. If men make pencils with green wood,

A LEAD PENCIL

the "leads" fall out when the wood shrinks, and the pencils often break into two pieces. So the pencil factories buy the planks when they are dry.

THINGS TO DO

1. Collect branches of soft wood trees and hard wood trees. Name them. What wood in your country do people use for (a) fire wood, (b) house building, (c) canoe or boat building?
2. Try to find pictures of evergreen trees in cold countries, men logging, floating logs down a river, etc. If you may, cut them out, and paste them in your book. Write a sentence under each.

QUESTIONS

1. Name a tree that is good for pencils.
2. Why do evergreen trees in cold countries have thin leaves like needles?
3. What is green wood?
4. Why do the men who bring the logs down a river have sharp nails on their boots?

A. From what trees in your country do all the leaves fall at one time? Do they fall from all these trees at the same time?

B. We use the word sharp as an adjective. We add -en to make it a verb. Change these adjectives to verbs by adding -en:

black sweet short

Write two of these verbs in two sentences.

C. Write words to rhyme with pine that are spelt in the same way.

CHAPTER III

BLACKLEAD FOR PENCILS

THERE are two kinds of lead. Men dig both from the ground. One kind of lead is used for making water pipes. It does not become rusty like tin or iron. The lead used for pencils is different. We call it blacklead or graphite.

Graphite is a kind of coal. Long ago dead trees, buried under the soil and pressed, became coal and graphite. The trees did not rot, they changed. They became black, shining and hard. We call this coal. Graphite is softer and smoother than coal.

Men dig for graphite in many countries. There are big graphite mines in U.S.A., Madagascar, Austria, Italy, and Czechoslovakia. There are many pencil factories in U.S.A., Czechoslovakia, and Austria. These countries export pencils instead of graphite.

In England there were graphite mines in Cumberland. Pencils were made there until all the graphite was finished. Now England imports graphite from Madagascar and Italy.

In a pencil factory a machine grinds graphite and clay to powder. Machines measure some of each

A LEAD PENCIL



A MINER AT WORK

powder and mix them together. For soft pencils they measure more graphite than clay. For hard pencils they measure more clay than graphite. To make coloured pencils men mix wax and dye with the clay, instead of graphite.

A man pours into the graphite and clay mixture enough water to make a thick black paste. He puts this paste in bags. A machine presses the bags and water drips from them. Another machine pushes

BLACKLEAD FOR PENCILS

the soft, black mixture through a little hole at the bottom of the machine. The blacklead comes out a long, thin, black thread. This is the "lead" we see in pencils.

A man cuts this long thread into pieces each as long as a pencil. He puts them in an oven. They bake until they are hard and dry. Hard pencils are baked in a hotter oven than soft pencils. The "leads" are now ready to be put into pencils. Much of this work is now done by machines.



PREPARING "LEADS"

A LEAD PENCIL

THINGS TO DO

1. On a map find the countries you read about in this chapter. Which of these countries are in Europe? Which countries must export pencils by train?
2. Follow on a map the voyage of a ship bringing graphite to England from Madagascar. Which of the two ways is the shorter and quicker?

QUESTIONS

1. Why does England import graphite now?
2. What is mixed with clay to make coloured pencils?
3. What kind of pencil has more graphite in it than clay?
4. Name two things that were trees long ago but are now quite different from wood.

A. The "ph" in graphite is sounded like f. Read these words:
Phillip *Pharisee* *photo* *telephone*

B. Put these words into the right sentences:

cheaper hotter smoother better

- (a) Juniper wood is . . . than pine wood for pencils.
- (b) Graphite is . . . than coal.
- (c) Hard pencils are often . . . than soft pencils.
- (d) Hard "leads" are baked in a . . . oven than soft "leads".

C. Write the right ends to these sentences:

(a) Coal is found	(b) Graphite is
inside trees.	a hard rock.
in the ground.	a liquid.
in wells.	a kind of coal.

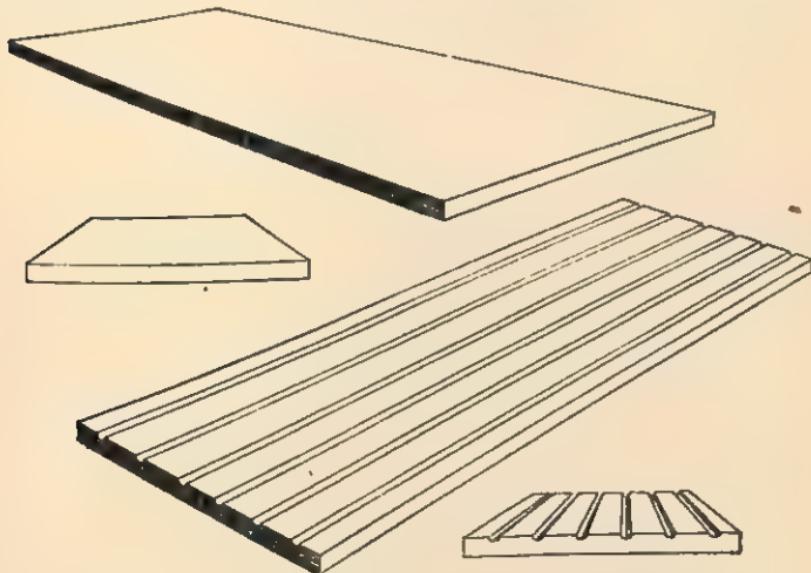
(c) Blacklead is pressed
in bags.
between rollers.
in tanks.

CHAPTER IV

MAKING THE PENCILS

WHEN the planks described in Chapter 2 are dry, some of them go to pencil factories. A machine cuts the dry planks into thin blocks. Each block is as thick as half a pencil. It is as long as a pencil. It is as wide as six pencils.

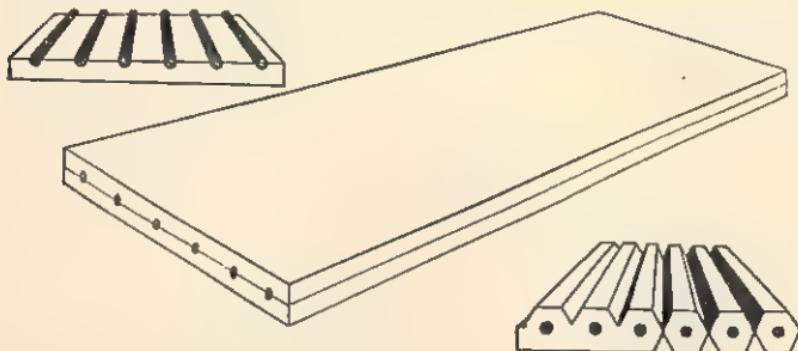
These blocks go through a machine that cuts six hollows in each. Each hollow is as deep as half the blacklead thread. These blocks and the "leads" then go to one room. A man puts six "leads"



PLAIN BLOCKS AND BLOCKS WITH HOLLOW
FOR THE "LEADS"

A LEAD PENCIL

into the six hollows in one block. He puts glue on the block. He puts another block on top of the glue. This sticks the two blocks together with the six leads between them. On many pencils we can see the place where the two blocks stick together.



BLOCKS WITH "LEADS", THE LAST PARTLY CUT
INTO PENCILS

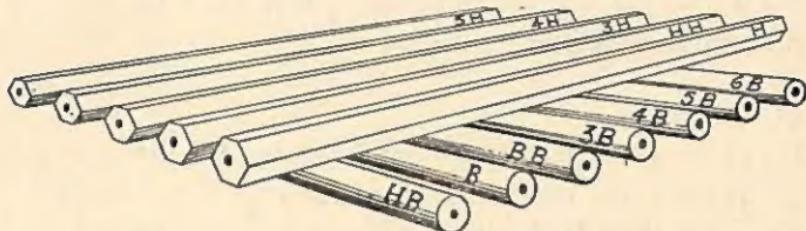
When the glue is dry and hard another machine cuts each pair of blocks into six pieces. Each piece makes one pencil. A machine makes the pencils round or cuts six sides on them. Another machine makes them smooth outside and cuts the ends straight. The last machine prints on the pencils the name of the maker and the name of the country.

If we look at different pencils we see capital letters printed on them. We may see B.B., B., H.B., H., or H.H. These capital letters tell us what kind of pencil we are using. A B.B. pencil has very soft lead. It makes thick, black marks on

MAKING THE PENCILS

paper. It is good for drawing pictures because the soft lines rub away easily. A B. pencil is not as soft as a B.B. but it is also good for drawing.

An H. pencil is hard. An H.H. is very hard. It makes very thin, hard lines on paper. They do not



HARD AND SOFT PENCILS

rub away easily. People use these hard pencils when they draw lines they wish to measure carefully. A purple pencil makes writing that is difficult to rub away. To make this pencil a purple dye is mixed with the graphite.

The best pencil for writing is the one marked H.B. The letters stand for Hard Black. It is easy to rub away this writing and the lead is not finished quickly. Always buy an H.B. pencil for school work.

THINGS TO DO

1. Measure a new pencil. How long is it? Draw an oblong 7 inches long and $1\frac{1}{2}$ inches wide. Divide the narrow ends into quarter-inches. Join by drawing dotted lines to divide the oblong into

A LEAD PENCIL

six long pieces. These lines show how pencils are cut from one block.

2. Look at the pencils the class is using. Write down the countries where they were made. Which of these countries is nearest to your country? Write down the maker, the country, and the kind of pencil you are using.

QUESTIONS

1. How many pencils are cut from one block?
2. What is the best pencil for drawing?
3. What does H.B. stand for?
4. Which has most clay in it, a B.B. or an H.H. pencil?

A. Number these sentences in the right order from 1 to 6, then read them:

and print names on the pencils.

He then puts glue on the block.

A machine cuts six hollows in each block.

paint the pencils,

Machines cut six pencils from each pair of blocks,

A man puts a lead into each hollow.

B. Fill in the missing words:

	-er	-est
—	—	smoothest
straight	—	—
—	better	—
hard	—	—
—	cheaper	—

C. There are two English words "lead" and "led" that have the same sound as "red". Put the right one into each of these gaps:

(a) That man . . . me to the . . . mine.
(b) The . . . in H.H. pencils is very hard.

You may find these words difficult. When you meet them in the book try to think out for yourself what they mean. If you cannot do this, ask your teacher for help.

Nouns

blacklead	logger
block	plank
century	pine
ever-green	quill
feather	reed
graphite	a saw
juniper	sign
lead	wax

Verbs

slip
shrink



Things We Use Series

1. A Packet of Tea
2. A Pound of Sugar
3. A Loaf of Bread
4. A Sack of Rice
5. A Tin of Salmon
6. A Tin of Meat
7. A Tin of Milk
8. A Tin of Butter or Cheese
9. A Woollen Blanket
10. Cotton and Other Threads
11. A Bar of Soap
12. A Packet of Needles
13. Oil
14. A Lead Pencil
15. Paper and Books
16. Money
17. A School Rubber
18. Salt
19. Glass and Plastics
20. Tin
21. A Cup of Coffee
22. A Bar of Chocolate
23. Silk
24. Leather

